CASE REPORT

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Neglected Posterior Subtalar Dislocation: A Case Report and Operative Technique

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Abstract

Posterior subtalar dislocation is an exceedingly rare entity. Early anatomic reduction, initially by closed means, is crucial. Failure to recognize this condition or any occurrence of neglect will complicate the management and worsen the outcome. There are a handful of case reports on posterior subtalar dislocation and even less for neglected cases. This study reports a neglected subtalar dislocation in a 26-year-old male who worked as a driver and had experienced high-energy trauma due to car collision. This patient was managed by open reduction and pinning, and was followed up 2 months later with a good outcome. This technique was selected to be able to achieve functional motions without pain.

Keywords: complication, intractable pain, open reduction, subtalar dislocation.

Dislokasi Posterior Sendi Subtalar yang Terlantar: Laporan Kasus dan Teknik Operasi

Abstrak

Dislokasi posterior sendi subtalar adalah hal yang sangat jarang terjadi. Reduksi secara anatomis pada awal kejadian, secara tertutup, sangat krusial. Kegagalan untuk mengenali kondisi ini atau tidak tepat penanganan akan menyulitkan manajemen dan memperburuk hasilnya. Hanya ada sedikit laporan kasus tentang dislokasi posterior sendi subtalar dan untuk kasus yang terlantar lebih jarang lagi ditemukan. Penelitian ini melaporkan sebuah kasus dislokasi posterior sendi subtalar yang terlantar pada pria berusia 26 tahun yang bekerja sebagai pengemudi dan mengalami trauma karena tabrakan mobil. Dilakukan reduksi terbuka dan pemasangan pin, serta ditindaklanjuti 2 bulan kemudian dengan hasil yang memuaskan. Teknik ini bertujuan untuk mencapai gerakan sendi yang funsional tanpa nyeri.

Kata kunci: Komplikasi, nyeri berat, reduksi terbuka, dislokasi subtalar

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Introduction

Subtalar joint dislocation is an uncommon injury, and cases of posterior subtalar dislocation are even rarer. This injury is characterized by a simultaneous dislocation of talocalcaneal and talonavicular joints while tibiotalar and calcaneocuboid articulations remains intact.[1] Under diagnosis by primary health care provider can occur because of the rarity of this injury, therefore delaying the proper treatment. Unsuccessful attempt of reduction could eventually result in severe swelling, intractable pain, vascular problems, and damages to the articular surfaces. This case highlights the clinical and imaging features of posterior subtalar dislocation, the complication from neglect, the reduction techniques with Schanz screw, and fixation with Kirschner wire that providers should be familiar with.

Case

A 26 years-old male minibus driver sustained an injury to his foot in a car collision one week prior to hospital admission. The exact mechanism was unknown, possibly a fastened foot during the forward flip of the body. He was brought to the nearest hospital, undergoing radiological examination, and diagnosed as posterior subtalar dislocation. An unsuccessful attempt of closed reduction was done. Then the doctor suggested to send him to the referral hospital, but the patient refused the medical advices. Instead, he went home and seek help from a traditional bone setter.

One week later, he came to our hospital due to the intractable pain and severe swelling. Physical examination revealed a slight plantarflexion, without neurovascular compromise (Figure 1). There were sores at the medial side, possibly from the initial trauma or the attempted reduction. He had no prior injuries or surgery to this ankle.

Plain radiographs and sagittal CT Scan of the foot revealed a posterior subtalar dislocation with calcaneocuboid joint remained intact (Figure 2a, 2b). Axial CT Scan showed a gap between talar body and calcaneus, without any horizontal translation (Figure 2c). We also noticed a displaced trigonum bone posterior to the talus.

On physical examination the subtalar dislocation was difficult to be observed, because there was no obvious medial or lateral translation of the calcaneus. Among the first differential diagnoses were fractures around foot and ankle, severe ankle sprain, or soft tissue contusions.

Figure 1 Clinical Picture Upon Arrival

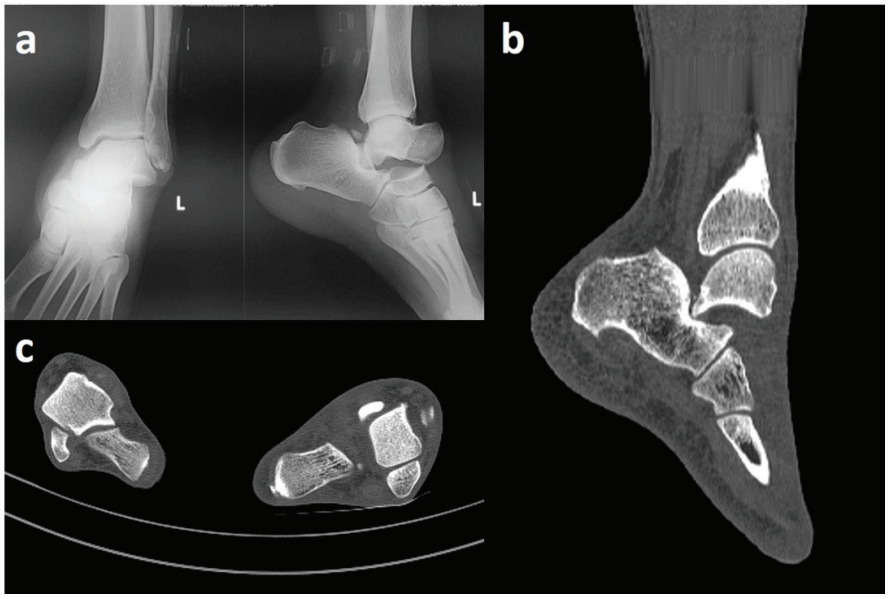

Figure 2 Imaging Studies (2a: Plain X-ray, 2b: Sagittal CT scan, 2c: Axial CT scan)

Imaging studies showed a posterior subtalar dislocation. Considering the acute setting, we can list severe swelling, impinged tissue, and buttonholing bone as possible reduction obstacles.

This study did the reduction operatively. Surgical indication for this case was unsuccessful closed reduction attempt. Considering the swollen foot, there were no place to do another attempt.

A Schanz screw was inserted to the calcaneus as a joystick for reduction. The calcaneus was

Figure 3 Intraoperative Reduction

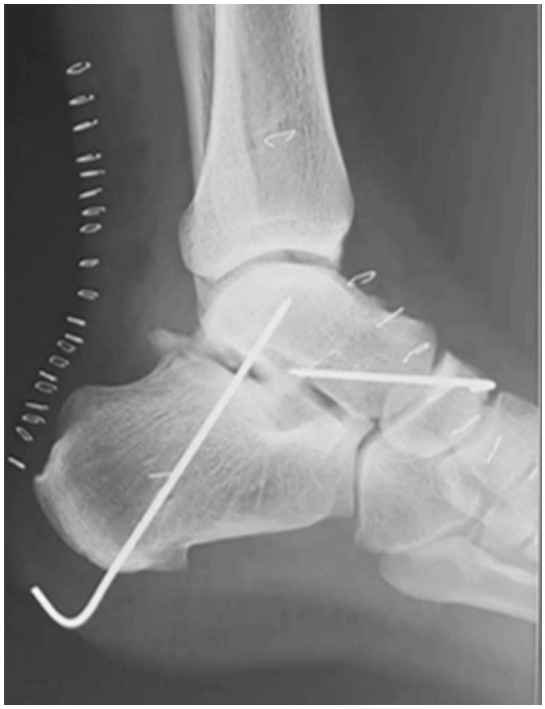

Figure 4 Immediate Post-operative X-ray

pulled downward and anteriorly to facilitate reduction (Figure 3). We noticed that the talar head was buttonholing to the surrounding tissue that hindered reduction. An incision was made at talonaviculare joint to release the soft tissue.

Hyper plantar flexion aims to reduce the strain on the flexor bundle and achilles so that the calcaneus is easy to move and gives the talonavicular joint distance so that the head of the talus is easily reduced.

After the subtalar and talonavicular joints were restored, several Kirschner wires was put across posterior facet for temporary fixation (Figure 4). The patient was sent home three days post-operative after the pain subsided and there was no sign of infection.

The wound healed uneventfully. At the 1-month follow-up the Kirschner wires was removed and the patient was able to walk partial weight bearing painlessly. Full weight bearing was achieved as advised at 2-months follow-up. We evaluated the functional results of our patient according to Gay and Evrard's criteria based on a study of pain, walking, mobility, stability and professional activities. We noted very good functional results with pain 3, instability 3, mobility 2, edema 2, occupation 3, adding up to 13 points.

Discussion

Subtalar dislocation is uncommon and accounts for approximately 1% of all dislocations. The talonavicular and talocalcaneal joints are involved simultaneously, while the tibiotalar and calcaneocuboid joints remain intact.[2,3,4] There is strong association between subtalar dislocation and high energy trauma, such as a fall from height or road traffic accidents. The mechanism of posterior dislocation is hyperplantarflexion of the foot. Both medial and lateral ligaments, along with interosseus ligament are torn posterior and anterior dislocations.[5,6,7] This patient's foot was slightly plantarflexed, without any locked supination or pronation. We found no rotational component of the calcaneus in this patient. This findings suggested the trauma was in pure hyperplantar flexion.[1]

In this case, talar head buttonholing is one among the obstacles for reduction, other than fibrosis and swollen condition the foot. Similar to irreducible medial subtalar dislocation, the talar head buttonholed through the extensor digitorum brevis (EDB) muscles and extensor retinaculum. There was also EDB muscle interpositioning between talus and naviculare.[8] The chance of repositioning the joint by closed manipulation diminished considerably over

time, while complications associated with closed reduction substantially increase due to fibrotic soft tissues.[9]

Following an unsuccessful attempt of closed reduction, open reduction is the next step. Release of capsule and other soft tissue is necessary to reduce the joint without tension. For this patient, an incision at talonavicular joint was performed to release the buttonholing talar head and EDB tendon interposition. The Schanz screw inserted to the calcaneus was beneficial to facilitate reduction as a joystick while avoiding further soft tissue injury as if the reduction was done by grasping the calcaneus. Talonavicular joint reduction was done simultaneously by simple manipulation using an elevator. After a stable reduction, an immobilisation is applied for 3-6 weeks, either by external support or internal fixation. The duration of immobilization is variable as there is a balance between avoiding instability and avoiding stiffness.[10] We decided to put several Kirschner wires to temporarily fix the subtalar joint. Using posterior cast splint as external support was other option, but in this case was opted out to facilitate wound care and accommodate swelling.

The goals for treating this dislocation is to prevent re-dislocation, recovery of an acceptable range of motion and strength of the extremity, in order to at least maintain daily activity.[11]

Complication include avascular necrosis of the talus, infection, posttraumatic arthritis, chronic subtalar instability, and complex regional pain syndrome with delayed reduction. Negative prognostic factors include lateral and open dislocations, total talar dislocations, and associated fractures.[13] A CT-scan is advisable after reduction to document additional bony injury to the subtalar area and adjacent bones.[12]

Posterior subtalar dislocation is very rare. The mild deformity may result in under diagnosis by healthcare provider and the patient's reluctance to undergo treatment. Unsuccessful attempt of closed reduction should prompt an investigation of the reduction obstacles and subsequent management, including surgical open reduction. Investigating talar head buttonholing to surrounding tissue is important. Tools such as Schanz screw is beneficial to facilitate reduction without further compromising soft tissue. Combining this technique with pinning K-wire fixation is a simple technique that can be performed by health care providers, with good results.

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